

EXHIBIT 8

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

CAPELLA PHOTONICS, INC.

§

v.

§

CASE NO. 2:20-CV-0076-JRG

FUJITSU NETWORK
COMMUNICATIONS, INC.

§

CAPELLA PHOTONICS, INC.

§

v.

§

CASE NO. 2:20-CV-0077-JRG

INFINERA CORPORATION, ET AL.

§

**EXPERT REPORT OF MICHAEL S. LEBBY REGARDING INVALIDITY OF
ASSERTED CLAIMS OF U.S. PATENT NOS. RE47,905 and RE47,906**

TABLE OF CONTENTS

I.	INTRODUCTION AND QUALIFICATIONS	1
	A. Career and Educational Background	1
	B. Patents, Publications, and Presentations	9
	C. Materials Considered	9
	D. Compensation	9
II.	SUMMARY OF OPINIONS	9
	A. The Asserted Claims Are Invalid as Obvious in View of Prior Art	10
	B. The Asserted Claims Are Invalid for Lack of Written Description.....	10
III.	UNDERSTANDING OF THE APPLICABLE LAW	10
	A. Invalidity Due to Lack of Written Description	10
	B. Claim Construction	11
	1. Dependent Claims	12
	2. Preamble as a Claim Limitation.....	12
	C. The “Clear and Convincing Evidence” Standard.....	13
	1. Invalidity in View of Prior Art.....	13
	a) Entitlement to an Earlier Priority Date Based on an Earlier- Filed Provisional Application	14
	b) Entitlement to an Earlier Priority or Effective Filing Date Based on Conception and Diligent Reduction to Practice	14
	c) Definition of Prior Art	15
	d) Obviousness	16
	2. Invalidity Due to Lack of Written Description	19
	3. Invalidity Due to Lack of Enablement.....	20
IV.	THE ASSERTED CLAIMS	20
V.	CLAIM CONSTRUCTION	20
VI.	THE ASSERTED CLAIMS’ ALLEGED PRIORITY DATE AND THE LEVEL OF ORDINARY SKILL IN THE ART	24
VII.	TECHNOLOGY BACKGROUND AND STATE OF THE ART	25
	A. Optical Switching.....	28

1.	Optical Cross-Connects	29
2.	Optical Add-Drop Multiplexers (“OADMs”) and Reconfigurable OADMs (“ROADMs”)	30
3.	Wavelength-Selective Switches (“WSSs”).....	33
a)	Microelectromechanical Mirrors (“MEMs”) WSSs	35
b)	Liquid Crystal (“LC”) WSSs	37
c)	Liquid Crystal on Silicon (“LCoS”) WSSs.....	38
B.	Commonly-Used Components for Optical Switching	40
1.	Optical Fibers.....	42
2.	Collimating Lenses	42
3.	Circulators.....	43
4.	Ports	43
a)	Circulator Ports	44
b)	Fiber Collimator Ports.....	44
5.	Mirrors	44
a)	Pivotal Mirrors	44
b)	Channel Micromirrors.....	45
c)	Silicon Micromachined Mirrors.....	45
d)	Alignment Mirrors	46
6.	Wavelength-Selective Devices	46
a)	Ruled Diffraction Gratings	47
b)	Holographic Diffraction Gratings	47
c)	Echelle Gratings.....	47
d)	Curved Diffraction Gratings	48
e)	Dispersing Prisms	48
7.	Beam Focusers	48

a)	Focusing Lenses.....	49
b)	Focusing Mirrors.....	49
C.	Commonly Used Spatial Arrangements of Components	49
1.	Positioning Generally.....	49
2.	Focal Points.....	50
3.	Arrays.....	50
a)	One-Dimensional Arrays	50
b)	Two-Dimensional Arrays.....	51
4.	WSSs Placed in Series	51
D.	Commonly Used Control Principles	51
1.	Control Generally.....	51
a)	Digital and Analog Control.....	51
b)	Continuous and Step-Wise Control	52
c)	Individual and Group Control.....	52
2.	Spectral Monitors and Power-Management Systems	53
a)	Spectral Monitors.....	53
b)	Power-Management Systems.....	53
3.	Servo-Control.....	54
a)	Coupling.....	54
b)	Coupling Efficiencies.....	54
VIII.	OVERVIEW OF THE ASSERTED PATENTS.....	55
A.	The Specification and Claims	55
1.	The Provisional Application	55
2.	The Common Specification	60
B.	The Prosecution Histories	63
1.	The IPR Proceedings of the Previous Patents.....	64

a)	IPR2014-01166, Patent RE42,368	66
b)	IPR2015-00726, Patent RE42,368	68
c)	IPR2015-00731, Patent RE42,368	70
d)	IPR2014-01276, Patent RE42,678	72
e)	IPR2015-00727, Patent RE42,678	74
f)	IPR2015-00739, Patent RE42,678	76
2.	The Prosecution Histories of the Asserted Patents	78
C.	Testimony Related to the Asserted Patents and the Previously Asserted Patents	79
1.	Testimony By Dr. Jeffrey Wilde, Named Inventor.....	79
2.	Testimony by Dr. Tai Chen, Named Inventor	86
3.	Testimony by Dr. Joseph Davis, Named Inventor.....	88
4.	Testimony By Dr. Sergienko, Capella's Technical Expert.....	94
IX.	OBVIOUSNESS	97
1.	The Scope and Content of the Prior Art.....	98
a)	U.S. Patent No. 6,816,640 (“Tew '640”).....	98
b)	U.S. Patent No. 6,798,941 (“Smith”.....	265
c)	U.S. Patent No. 6,097,859 (“Solgaard”.....	346
d)	U.S. Patent No. 7,106,966 (“Lalonde ”)	420
e)	U.S. Patent No. 6,625,340 (“Sparks”.....	519
f)	U.S. Patent No. 6,498,872 (“Bouevitch”.....	608
g)	U.S. Patent No. 6,978,062 (“Rose”.....	683
h)	U.S. Patent No. 6,618,520 (“Tew '520”.....	779
i)	U.S. Patent Publication No. 2002/0081070 (“Tew '070”.....	789
j)	U.S. Patent No. 6,442,307 (“Carr”.....	795
k)	U.S. Patent No. 6,496,291 (“Raj”.....	797

1)	U.S. Patent No. 6,583,934 (“Kramer”)	800
m)	Yuan & Riza, General Formula for Coupling-loss Characterization of Single-mode Fiber Collimators by Use of Gradient-index Rod Lenses (“Yuan”)	803
2.	The Differences Between the Claimed Invention and the Prior Art.....	804
a)	Obviousness Based on Tew '640.....	804
b)	Obviousness Based on Smith.....	823
c)	Obviousness Based on Solgaard.....	831
d)	Obviousness Based on Lalonde	846
e)	Obviousness Based on Sparks	859
f)	Obviousness Based on Bouevitch.....	874
g)	Obviousness Based on Rose	893
3.	Secondary Considerations.....	911
4.	Conclusion of Obviousness.....	915
X.	LACK OF WRITTEN DESCRIPTION.....	915
A.	The Common Specification Lacks Written Description Support for a System That Uses Non-Movable, Non-Reflective Beam-Deflecting Elements.....	915
B.	The Specification Lacks Written Description Support for a System that Does Not Continuously Control Channel Micromirrors or Beam-Deflecting Elements.....	924
C.	The Specification Lacks Written Description Support for a System that Does Not Individually Control Channel Micromirrors or Beam-Deflecting Elements.....	926
XI.	CONCLUSION.....	929

Table of Appendices

Appendix	Description
A	Curriculum Vitae of Michael S. Lebby
B	Materials Considered in Forming Opinions
C	Text of Asserted Claims of the Asserted Patent RE47,905
D	Text of Asserted Claims of the Asserted Patent RE47,906
E	PTAB's Findings
F	Comparison of Asserted Claims to Claims of the Previously Asserted Patents

I. INTRODUCTION AND QUALIFICATIONS

1. My name is Michael S. Lebby, and I have been retained as an expert by (1) Infinera Corporation, Tellabs, Inc., Tellabs Operations Inc., Coriant America Inc., and Coriant (USA) Inc. (collectively, “Infinera”), in connection with Capella Photonics, Inc. v. Infinera Corp., et al., Case No. 2:20-CV-0077-JRG (E.D. Tex.) and (2) Fujitsu Network Communications, Inc. (“FNC” and together with Infinera, “Defendants”), in connection with Capella Photonics, Inc. v. Fujitsu Network Communications, Inc., Case No. 2:20-CV-0076-JRG (E.D. Tex.).

2. In this report, I set forth my current opinions regarding the following patents (the “Asserted Patents”), including the validity of their claims (the “Asserted Claims”): Claims 23–29, 31–35, 37, 39, and 44–54 of U.S. Patent No. RE47,905 (the “905 Patent”); and Claims 68–72, 79–85, 87–92, 96–100, 106, 115–118, 122–127, 129–135, and 137–139 of U.S. Patent No. RE47,906 (the “906 Patent”). This report also provides the bases and reasons for those opinions. I may offer additional opinions based on further review of materials in this case, including opinions and/or testimony of other witnesses.

3. Below, I have summarized my educational background, career history, publications, and other relevant qualifications. My full *curriculum vitae* is attached as Appendix A to this report.

A. Career and Educational Background

4. I am currently the CEO of Lightwave Logic, a company engaged in developing novel polymer modulators devices.

5. I am also the CEO and CTO of Oculi LLC, where I perform expert witness consulting concerning electronics, photonics, optoelectronics, semiconductors, and communications equipment technology. I am also currently a technical expert for the Photonics

A. The Asserted Claims Are Invalid as Obvious in View of Prior Art

28. It is my opinion that each of the Asserted Claims are anticipated and/or rendered obvious by the prior art under 35 U.S.C. 103.¹

B. The Asserted Claims Are Invalid for Lack of Written Description

29. It is my opinion that claims 23–29, 31–35, 37, 39, and 44–54 of the '905 Patent and claims 68–72, 79–85, 87–92, 96–100, 106, 115–118, 122–127, 129–135, and 137–139 of the '906 Patent are invalid for lack of written description under pre-AIA 35 U.S.C. § 112, ¶ 1.

III. UNDERSTANDING OF THE APPLICABLE LAW

30. I am not an attorney and will not offer opinions on the law. However, I have been provided an understanding of several principles concerning the validity of patent claims which have guided me in arriving at my stated conclusions in this report.

A. Invalidity Due to Lack of Written Description

31. I understand that a patent must contain a written description of the claimed invention that is sufficient to convey to one of ordinary skill in the art that the inventor had possession of the claimed invention at the time the inventor filed the patent application. I understand that this is legally referred to as the “written description” requirement.

32. I understand that the written description must actually or inherently disclose each and every element of a claim for that claim to meet the written description requirement, and that

¹ It is my understanding that the America Invents Act (AIA) modified the statutory bases governing a patent's validity, including 35 U.S.C. §§ 102, 103, and 112, for patents with certain priority claims for September 16, 2012 or later. Given that the earliest possible priority date for the Asserted Claims is March 19, 2001 (as explained below in Section VI), my analysis utilizes my understanding of the pre-AIA versions of these statutory sections, which uses a first-to-invent criteria.

<u>Disputed Term</u>	<u>Construction</u>
“corresponding” • '905 Patent Claims 23, 47, 49, 51 • '906 Patent Claims 68, 89, 100, 115, 133	Plain and ordinary meaning
“said elements being individually . . . controllable” • '905 Patent Claims 23, 47, 49	“each of the elements being controllable separately from the other elements”
“said channel micromirrors being individually . . . controllable” • '906 Patent Claims 68, 115	“each of the micromirrors being controllable separately from the other micromirrors”
“said channel micromirrors being individually controllable” • '906 Patent Claim 89	“each of the channel micromirrors being controllable separately from the other channel micromirrors”
“said channel micromirrors being individually . . . controllable” • '906 Patent Claim 100	“each of the channel micromirrors being controllable separately from the other channel micromirrors”
“said auxiliary channel micromirrors are individually pivotable” • '906 Patent Claim 127	“each of the auxiliary channel micromirrors being pivotable separately from the other auxiliary channel micromirrors”

In the event the Court modifies these constructions or enters new constructions, I reserve the right to offer modified or new opinions to address those constructions.

VI. THE ASSERTED CLAIMS' ALLEGED PRIORITY DATE AND THE LEVEL OF ORDINARY SKILL IN THE ART

69. It is my understanding that Capella has alleged that the Asserted Claims are entitled to a priority date of March 19, 2001, based on the filing of the Provisional Application. *See, e.g.*, Plaintiff Capella Photonics, Inc.'s Objections and Responses to Defendants' First Set of Interrogatories (Nos. 1-20) at 6-7 (Nov. 9, 2020) (Capella's Response to Interrogatory No. 1).

70. In forming my opinions, I have considered the level of ordinary skill in the art on and around March 19, 2001. In determining the characteristics of a hypothetical POSITA for the Asserted Patents in the relevant timeframes, I considered several things, including my over three decades of experience in the field of optical switching, the sophistication of the technology involved and the educational background and experience of those actively working in the field. I placed myself back in the relevant timeframes and considered the engineers that I had worked with in the field.

71. In my opinion, a POSITA on or around March 19, 2001 would have been an engineer or physicist with at least a Master's degree, or equivalent experience, in optics, physics, electrical engineering, or a related field, including at least three years of additional experience designing, constructing, and/or testing optical systems. Additional industry experience or technical training may offset less formal education, while more advanced degrees or additional formal education may offset lesser levels of industry experience.

72. Based upon my education and experience, I am very familiar with the level of relevant knowledge about the technology at issue that a POSITA would have possessed on or around March 19, 2001. As a result of my education and experience in the industry, I am very familiar with the state of the art of optical switching during that timeframe.

73. Although my qualifications exceed those of a POSITA, both as of March 19, 2001 and today, I have nonetheless applied the perspective of a POSITA in rendering my opinions throughout this report.

VII. TECHNOLOGY BACKGROUND AND STATE OF THE ART

74. Telecommunications has a long and innovative history. Even in the 1880s, Alexander Graham Bell, one of the pioneers of the telephone actually patented an optical communication system that he called the photophone. This was an advancement of his earlier

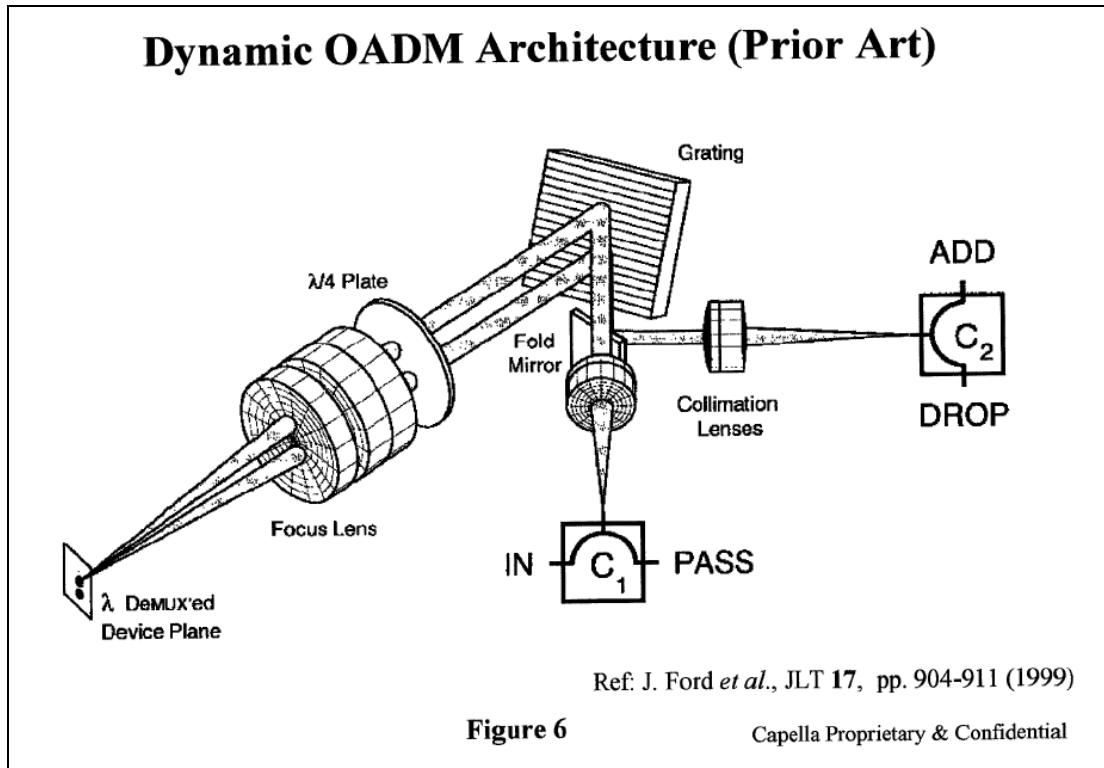
VIII. OVERVIEW OF THE ASSERTED PATENTS

A. The Specification and Claims

139. I have reviewed the specification and the claims of the Asserted Patents. The Asserted Patents share a common specification and claim priority through a chain of patent applications back to the Provisional Application (which, as noted above, was filed on March 19, 2001), which I have also reviewed. The '906 Patent explicitly incorporates the Provisional Application by reference. *See* '906 Patent at 1:31–36.

1. The Provisional Application

140. The Provisional Application describes various components, devices, and principles that existed in the prior art. For example, the Provisional Application provides as Figure 6 a diagram from Joseph E. Ford et al., 17 J. LIGHTWAVE TECH., pp. 904–11 (1999):



This figure shows various optical devices and principles known in the prior art, including (1) coupling lenses/circulators, (2) collimating lenses, (3) mirrors, (4) diffraction gratings,

2064. Claims 51–54 of the '905 Patent and claims 133–35 and 137–39 of the '906 Patent do not explicitly require “individually controllable” “channel micromirrors” or “beam-deflecting elements.” Assuming that “individually controllable” is not inherently required by these claims, it is my opinion that a POSITA reviewing the specification would not understand that the named inventors were in possession of the full scope of the alleged invention. There is no disclosure or mention in the Asserted Patents of “channel micromirrors” or “beam-deflecting elements” that are not “individually controllable,” and every embodiment requires individual control.

2065. Based on the disclosures of the Asserted Patents, a POSITA would not understand that the inventors had invented a wavelength separating and routing apparatus or an optical add-drop multiplexer in which “channel micromirrors” or “beam-deflecting elements” are not individually controllable.

XI. CONCLUSION

2066. For the reasons explained above, I conclude that each of the Asserted Claims are invalid for multiple independent reasons. My opinions on other relevant issues are also set forth herein.

2067. I reserve the right to amend and/or supplement the foregoing in accordance with applicable Court rules, orders and procedures, and in response to newly disclosed positions on invalidity issues by Capella.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Executed on March 15, 2021

By:



Michael S. Lebby